Converting a MAD8 file to MADX

Eliana Gianfelice-Wendt

I. INTRODUCTION

Converting the MAD8 input file itself is in general difficult. For this reason a file produced by MAD8 is used instead by the conversion fortran code tomadx_edges.f.

The conversion code writes the lattice as a sequence. In order to preserve valuable informations about the magnet type, the second code here described can be used afterwards.

II. TO MADX CONVERSION

The recognized elements are shown in Table I.

TABLE I. Recognized elements

RBEND	SBEND	DRIFT	QUADRUPOLE	SEXTUPOLE	OCTUPOLE	MULTIPOLE
KICKER	HKICKER	VKICKER	MONITOR	HMONITOR	VMONITOR	INSTRUMENT
RFCAVITY	RCOLLIMATOR	MARKER				

The MAD8 output file used as input is expected to be named LATTICE.DAT and is created by the command STRUCTURE,FILENAME=lattice.dat,ORDER=5.

The output files are written in a directory named "dummy" which must be created before execution.

- dummy/values.dat ... it contains the values of the magnet parameters for bending magnets, quadrupoles and sextupoles;
- dummy/madx.def ..... it contains the element definitions;
- dummy/madx.seq .....it contains the sequence. The positions refer to the middle of the elements, which is the MADX default.

The MADX job will need only the calls to these three files. In addition, for possible user diagnostic purposes and convenience, following files will contain only selected types

- dummy/multipoles_madx.def ... it contains only the multipoles ;
- dummy/markers.def .... it contains only the markers;
- dummy/multi_sext.dat .... it contains only the multipoles with sextupolar components;
- dummy/sext.dat .... it contains only the sextupoles.

The file tomadx.out and test_pos.dat are written for checks.

To be added manually:

- The user sequence name in madx.seq
- The cavity definition contains only type and length, the other parameters must be added manually in madx.def
- Octupole (and above) magnets strength values must be added manually in madx.def because they are not stored in LATTICE.DAT, unless they are components of a MULTIPOLE element.
- Kick values must be added manually in madx.def because they are not stored in LATTICE.DAT

III. ADDING ELEMENT INFO

The fortran code tomadx_edges_add_types.f reads the file madx.def created by tomadx_edges.f and a user chosen MAD8 input file where it searches for the string TYPE for each element appearing in madx.def. If found, the information is added to the element definition. The output file is named madx_types.def.